

## 8. RADIOACTIVE SUBSTANCES AND CONTAMINATION

### 8.1 Introduction

Radioactive substances are composed of pure radionuclides or mixtures of radionuclides. Radionuclides are unstable atoms or isotopes of the natural and manmade elements that make up the matter in the universe. The number and arrangement of the small particles (i.e., protons, neutrons, and electrons) of which atoms are composed distinguish one element from another. There are about 1700 nuclides of the more than 100 natural and manmade elements (which can be in the form of gas, solid, or liquid). When unstable nuclides change into their more stable form (through a process known as disintegration or decay), they release invisible waves of energy or particles, known as ionizing radiation. The natural activity of emitting ionizing radiation is called radioactivity. Ionizing radiation deposits energy in matter and causes a chemical change. When this occurs in human tissue it can cause a variety of ill-health effects in people, the most serious of which is cancer.

The existence of radioactive substances and contamination throughout the Department of Energy facilities stems mostly from the production of nuclear weapons since the early 1940's. The end of the Cold War has instigated a change in national priorities shifting DOE's mission from nuclear weapons production to cleanup of nuclear weapons facilities. Decontaminating and decommissioning these aging facilities and cleaning up the environmental damage that has occurred from 50 years of production present a major challenge. There are approximately 100 contaminated installations spread out over 36 states and territories. DOE property that used radionuclides or has radioactive contamination includes, but is not limited to, sites identified in the Formerly Utilized Sites Remedial Action Program (FUSRAP), Surplus Facilities Management Program (SFMP), and Uranium Mill Tailings Remedial Action (UMTRA) program.

DOE and its predecessor, the Atomic Energy Commission (AEC), have been aware of the dangers of radiation and have set guidelines, based on U.S. Environmental Protection Agency (EPA) standards, Nuclear Regulatory Commission (NRC) guidelines, and International Council of Radiation Protection (ICRP) guidelines to stringently protect workers and the public against radiation. An extensive body of literature exists on radiation carcinogenesis in man and animals that indicates that ionizing radiation can be considered "pancarcinogenic" (i.e., acts as a complete carcinogen by serving as both an initiator and a promoter of cancer in almost any tissue or organ).

Although the carcinogenic effects typically are used as the sole basis for assessing radiation-related human health risks of a site (or substance) contaminated with radionuclides, be aware that noncarcinogenic effects (teratogenicity and mutagenicity) increase with exposure to radiation. Teratogenicity is the ability to induce or increase the incidence of congenital malformations, which are permanent structural or functional deviations produced during embryonic growth and development. Mutagenicity is the ability to induce genetic mutation in the nuclei of either body cells or reproductive cells.

Under the Atomic Energy Act (AEA) of 1954, as amended, DOE is responsible for implementing and enforcing all regulations governing the monitoring and control of radionuclides released by DOE operations. DOE issued DOE Order 5400.5, "Radiation Protection of the Public and the Environment" under the authority of the AEA. In addition, the Uranium Mill Tailings Radiation Control Act, which amended the Atomic Energy Act, applies to DOE sites in the UMTRA program. UMTRA sites are covered by separate requirements enforced by EPA under the Uranium Mill Tailings Radiation Control Act of 1978 (as amended by the Uranium Mill Tailings Remedial Action Amendments Act of 1988). Note that state and local governments may impose their own radiological protection requirements; however,

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these requirements will not be discussed because they are beyond the scope of this document.

### 8.2 Drivers for the Requirements

There are several mandates that drive the need to comply with requirements protecting the public from radioactive substances and contamination in real property transfers: GSA regulations at 41 CFR 101-47.202-2(b)(10) and DOE Order 5400.5, Chapters II and IV. EPA regulations in 40 CFR Part 192, "Standards for Remedial Actions at Inactive Uranium Processing Sites" apply to UMTRA sites only. Because of the uniqueness of these EPA requirements for UMTRA sites, no further discussion will be made of UMTRA sites except in § 8.9.

In addition, CERCLA § 120(h), implemented via EPA regulations at 40 CFR Part 373, requires reporting of radionuclides in real property transfers. Bureau of Land Management regulations at 43 CFR 2372.1 require reporting of the extent to which contamination has occurred and decontamination has taken place or will take place.

### 8.3 Requirements in Real Property Transfers

The requirements of DOE Order 5400.5 must be met before property on which any radioactive substances or residual radioactive material (see glossary) was present can be released. No analogous requirements can be found for any other kind of hazardous substance. In particular, DOE Order 5400.5, Chapter II, § 5, ¶ a, b, and c and Chapter IV state the generic guidelines for residual radioactive material (see Exhibit 8-1) for all sites except UMTRA sites (which are covered by 40 CFR Part 192). DOE Order 5400.5 also mandates that FUSRAP and SFMP sites be subjected to the requirements in DOE/CH-8901, *A Manual for Implementing Residual Radioactive Material Guidelines, A Supplement to the U.S. Department of Energy Guidelines for Residual Radioactive Material at FUSRAP and SFMP Sites*. DOE/CH-8901 provides procedures for deriving specific guidelines for allowable levels of residual radioactive material for specific types of property from basic dose limits.

The other requirements, including the GSA requirements, are merely reporting requirements. CERCLA § 120(h) requires identification of uncontaminated parcels of land (see § 8.4.4), notification of leases (see § 8.9), reporting data on deeds (see § 8.12), and placing a covenant in deeds (see § 8.12). The Bureau of Land Management requires identification of contaminated parcels in withdrawn land being returned to the public domain (see § 8.10).

Radioactive PCBs and radioactive asbestos are subject to non-radiological regulatory requirements under the Toxic Substances Control Act, Asbestos Hazard Emergency Response Act, and Asbestos School Hazard Abatement Reauthorization Act, as well as those of DOE Order 5400.5. Refer to Chapter 9 for PCBs and Chapter 10 for asbestos.

### 8.4 Implementation of the Requirements

#### 8.4.1 Definitions

To implement the requirements in Exhibit 8-1, you must first understand how and where radionuclides and radioactive contamination may be present at your facility. You should be familiar with how radioactive hazards are generally grouped, given as follows:

- (1) Residual concentrations of radionuclides in soil,
- (2) Concentrations of airborne radon decay products,
- (3) External gamma radiation (see glossary),
- (4) Surface contamination, and
- (5) Radionuclide concentrations in air or water resulting from or associated with any of the above.

You must also understand and distinguish between basic dose limits, guidelines, authorized limits, and the policy of "As Low As Reasonably Achievable (ALARA)." Basic dose limits resulting from exposures to properties or equipment contaminated

**Exhibit 8-1. Generic Guidelines for Residual Radioactive Material**

**Residual Radionuclides in Soil.** Concentrations of radioactive material in soil are defined as those in excess of background concentrations averaged over an area of 100 square meters.

**Hot Spots.** If the average concentration in any surface or below-surface area less than or equal to 25 square meters exceeds the basic dose limit (100 mrem/yr) or guideline (see the table at end of exhibit) by a factor of  $(100/A)^{0.5}$ , where A is the area in square meters of the region in which concentrations are elevated, then limits for "hot-spots" shall be developed and applied according to DOE/CH-8901. In addition, reasonable efforts shall be made to remove any source of radionuclide that exceeds 30 times the appropriate limit for soil (see table), regardless of the average concentration in the soil.

**Generic Guidelines.** Concentrations of Radium-226 and -228, and thorium-230 and -232 should neither exceed 5 picocuries per gram (pCi/g) averaged over the first 15 cm of soil below the surface nor 15 pCi/g averaged over 15-cm-thick layers of soil more than 15 cm below the surface.

**Ingrowth and Mixtures.** The generic guidelines take into account ingrowth of Radium-226 from Thorium-230 and of Radium-228 from Thorium-232, and assume secular equilibrium (see glossary). If other mixtures of radionuclides occur, the concentrations of individual radionuclides shall be reduced so that either the dose for the mixtures will not exceed the basic dose limit (100 mrem/yr) or the sum of the ratios of the soil concentration of each radionuclide to the allowable limit for that radionuclide (see table below) will not exceed unity. Explicit formulas for calculating residual concentration guidelines for mixtures are given in DOE/CH-8901.

**Airborne Radon Decay Products.** The radon decay product concentration (including background) shall not exceed 0.03 Working Level. A Working Level (WL) is any combination of short-lived radon decay products in 1 liter of air that will result in the ultimate emission of  $1.3 \times 10^5$  MeV of potential alpha energy. Remedial actions are not required when there is reasonable assurance that residual radioactive material is not the source of the radon concentration.

**External Gamma Radiation.** The average level of gamma radiation (see glossary) inside a building or habitable structure on a site to be released without restrictions shall not exceed the background level by more than 20 uR/hr and shall comply with the basic dose limit (100 mrem) when an "appropriate-use" scenario (e.g., an industrial/commercial use) is considered.

**Surface Contamination.** The generic surface contamination guidelines apply to existing structures and equipment including interior equipment and building components that are potentially salvageable or recoverable scrap. A table of surface contamination guidelines showing, in disintegrations per minute (dpm) per 100 cm<sup>2</sup>, the average, maximum, and removable total residual contamination allowed is found in Figure IV-1 of DOE 5400.5 (reproduced as a table on the next page). These guidelines are based on the Nuclear Regulatory Commission's *Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source or Special Nuclear Material*.

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### Exhibit 8-1. Generic Guidelines for Residual Radioactive Material (Continued)

Type of Radioactive Substance	Acceptable Surface Contamination Levels (disintegrations per minute/100 square centimeters) <sup>1</sup>		
	Average <sup>2, 3</sup>	Maximum <sup>3, 4</sup>	Removable <sup>5</sup>
Beta/Gamma emitters <sup>6</sup> (except strontium-90); Uranium-natural, -235, & -238, and their associated decay product alpha emitters	5,000	15,000	1,000
Transuranics; Iodine-125, and -129; Radium-226 and -228; Actinium-227; Thorium-228 & -230; and Protactinium-231	Reserved	Reserved	Reserved
Thorium-natural and -232; Strontium-90; Iodine-126, -131, & -133; Radium-223 & -224, and Uranium-232	1,000	3,000	200

<sup>1</sup> The dpm emitted by radioactive material as determined by correcting for background, efficiency, and geometric factors associated with the instrumentation.

<sup>2</sup> Measurements of average contamination should not be averaged over an area of more than one square meter. For objects of less surface area, the average should be derived for each such object.

<sup>3</sup> The average and maximum dose rates associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h, respectively, at 1 cm.

<sup>4</sup> The maximum concentration level applies to an area of not more than 100 square centimeters.

<sup>5</sup> The amount of removable material per 100 square centimeters of surface area should be determined by wiping an area of that size with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wiping with an appropriate instrument of known efficiency. When removable contamination on objects of surface area less than 100 square centimeters is determined, the activity per unit area should be based on the actual area, and the entire surface should be wiped. It is not necessary to use wiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable concentration.

<sup>6</sup> Where surface contamination by both alpha- and beta-gamma emitting radionuclides exists, the limits established for alpha- and beta-gamma emitting radionuclides should apply independently.

with residual radioactive material have been prescribed in standards. From these standards, numbers can be derived and specified in terms of an effective dose equivalent (see glossary). Three radiological protection standards are pertinent:

- (1) 40 CFR Part 192, *Standards for Remedial Actions at Inactive Uranium Processing Sites* (January 1983)
- (2) Nuclear Regulatory Commission, Regulatory Guide 1.86, *Termination of Operating Licenses for Nuclear Reactors* (June 1974)
- (3) Nuclear Regulatory Commission publication, *Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source or Special Nuclear Material* (July 1982)

In consideration of these three radiological protection standards, DOE Order 5400.5, Chapter II, § 1, ¶ a, proclaims as official policy that the public shall not be exposed to an effective dose equivalent greater than 100 mrem/yr (1 mSv/yr) (excluding naturally-occurring background radiation) as a consequence of all routine DOE activities. The basic dose limit is used for deriving guidelines (see next paragraph) for the first four of the five groups of aforementioned radioactive hazards. (Guidelines for radionuclide concentrations in air and water are set by EPA in 40 CFR Part 61 and 40 CFR Part 141, respectively.) See text box for temporary higher public dose limit.

A guideline for residual radioactive material is a level of radioactivity that is acceptable for use of a property without restrictions. Guidelines are generally predicated on a presumed "worst-case, plausible-use" scenario for a property. There are two kinds of guidelines: generic and specific. Generic guidelines are independent of the type of property, derived from the basic dose limit, and given in Exhibit 8-1. Specific guidelines are also derived from the basic dose limit but are calculated using specific property models and data; DOE/CH-8901 gives procedures and data for derivation of specific guidelines.

#### **Temporary Higher Dose Limit**

Under unusual circumstances, a temporary higher public dose limit may be requested from EH-1 provided that it is accompanied by documentation that discusses the need for the increase, the alternatives considered, and the application of the ALARA process. The temporary higher dose limit is derived from the recommendations of the International Commission on Radiological Protection (ICRP Publication 45) for a principal dose limit of 100 mrem effective dose equivalent in a year for exposures to the public, and a subsidiary dose limit of 500 mrem effective dose equivalent in a year, for some years, if the dose averaged over a lifetime does not exceed the principal limit of 100 mrem effective dose equivalent per year.

An authorized limit is a level of residual radioactivity that shall not be exceeded if the remedial action is to be considered completed and the property is to be released without restrictions. Under normal circumstances, authorized limits for residual radioactive material are set equal to the guideline values (discussed above). Exceptions occur when the guideline values are not appropriate for use at a specific property. In such cases, authorized limits are to be established that do not exceed the basic dose limit (100 mrem/yr) under the "worst-case" or "plausible-use" scenarios, consistent with the procedures and guidance provided in DOE/CH-8901 or consistent with the applicable generic guidelines.

As Low As Reasonably Achievable (ALARA) is a phrase (acronym) used to describe an approach to radiation protection to control or manage exposures (both individual and collective to the work force and the general public) and releases of radioactive material to the environment as low as social, technical, economic, practical, and public policy considerations permit. ALARA is not a dose limit but rather a process that has as its objective the attainment of dose levels as far below the applicable limits as practicable. DOE Order 5400.5, Chapter IV, § 2, ¶ e, requires that applications of ALARA policy be documented and filed as permanent records.

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### **8.4.2 Sources of Records on Radioactive Substances and Contamination**

It is prudent to conduct a preliminary records search before conducting a radiological survey of the property. Records include information and data necessary to identify and characterize radioactive materials by their release and fate in the environment, and their probable impact on radiation doses to the public. Information and data must be retained in accordance with the requirements of DOE Order 1324.2 and other legally applicable requirements.

It is important to determine if your facility has any records required by these regulations. A good starting point is the collection of hazardous waste manifests, manifest discrepancy reports, notifications of Low-Level Waste (LLW) activity, or approval for a LLW landfill.

Radioactive spills or releases (either planned or unplanned) must be reported in accordance with DOE Orders 5400.1 and 5484.1 as well as a notification of the relevant Program Office and the Deputy Assistant Secretary for Environment of actual or potential exposures of members of the public that could result in either:

- (1) An effective dose equivalent exceeding 10 mrem in a year;
- (2) Exceeding any limit (such as not meeting any other requirement specified in DOE Order 5400.5 or any other legally applicable limit); or
- (3) Exceeding a combined dose equal to or greater than 100 mrem effective dose equivalent in a year due to DOE and other man-made sources of radiation (except medical, consumer product, and natural sources).

Additionally, you may want to refer to the Annual Site Environmental Report that must be prepared by October 1 of each calendar year under DOE Order O 231.1, "Environmental, Safety, and Health Reporting," (formerly DOE Order 5400.1, "General Environmental Protection Program"). DOE M 231.1, the mandatory manual implementing the DOE Order, provides that the Annual Site

Environmental Report must review the facility's compliance with all environmental requirements, discuss noncompliances, and describe corrective actions. In addition, the Compliance Summary of the Annual Site Environmental Report must discuss notices of violation issued by a regulatory agency.

Lastly, DOE's Office of Field Management (FM-20) has developed a Facilities Information Management System (FIMS) database that will include information on hazardous materials on DOE-owned, DOE-leased, GSA-assigned, and contractor-leased land, buildings, trailers, and other structures. As of August 1997, FM-20 was still working with DOE field elements to populate unclassified data for hazardous substances (including radioactive substances).

### **8.4.3 Radiological Surveys**

DOE Order 5400.5, Chapter II, § 5, ¶ (c), states that prior to being released, property shall be surveyed to determine whether both removable and total surface contamination (including contamination present on and under any coating) is greater than the levels given in Exhibit 8-1 and the contamination has been subjected to the ALARA process. You must have the survey conducted on areas of the property that have the potential for contamination. Areas have the potential for contamination if they have been

- (1) Used for storing, handling, processing, or treating unconfined radioactive substances; or
- (2) Exposed to beams of particles capable of inducing radiation (e.g., neutrons and protons).

You must ensure that instruments and techniques used for radiological surveys of areas of potential contamination are appropriate for detecting the levels of radiation in the guidelines given in Exhibit 8-1.

Where potentially contaminated surfaces are not accessible for radiological survey (e.g., pipes, drains, and ductwork), such an area of the property is released on a case-by-case evaluation. The evaluation is based on both the history of the use of the area and available measurements. If the

unsurveyable surfaces are likely to be within the limits given in Exhibit 8-1, then the area may be released.

Documentation of the radiological survey is required for release of the property and is described in § 8.12.

#### **8.4.4 Identification of Contaminated and Uncontaminated Parcels**

You can use the identification of parcels of contaminated land to satisfy BLM requirements (see § 8.10). You must also report on whether remedial action necessary to protect human health and the environment has been taken or will be completed (see § 8.5, § 8.10 and § 8.12). You can use the identification of parcels of uncontaminated land to satisfy CERCLA § 120(h)(4) for Federal facilities being closed. The identification of parcels of land uncontaminated by radionuclides, as with the other hazardous substances, hazardous wastes, and petroleum products, is subject to concurrence by EPA for sites on the National Priorities List or by the appropriate state for all other sites.

Note that there may be instances in which DOE or another authority will impose restrictions on the management and/or use of the property if the residual radioactive material guidelines of Chapter IV of DOE Order 5400.5 are not met or if other applicable Federal, State, or local requirements impose such restrictions. Restrictions and controls on the use of property with residual radioactive material exceeding the authorized limits are discussed in DOE Order 5400.5 Chapter IV, § 6 and § 7.

### **8.5 GSA-Specific Requirements**

If an amount equal to or greater than the RQ of a radionuclide (see 40 CFR 302, Table 302.4, Appendix B) has been stored for one or more years, or if an amount equal to or more than the RQ of a radionuclide has been disposed of, spilled, or otherwise released on DOE property (see Exhibit 6-2), report this information to the extent that it is available on the basis of a complete search of DOE files (40 CFR 373.1) (see text box). Also, report the dates on which radionuclides were stored, released, or disposed of in excess of the quantity and time thresholds. In addition, report any remedial action necessary to protect human health

#### **Basis for Radiation Hazard**

Although CERCLA §120(h)(1) and (3) and 40 CFR 373.1 give a reporting threshold in units of weight, weight is a wholly inappropriate measurement for radionuclides. Furthermore, a storage reporting threshold of 1,000 kg is far too excessive for radionuclides. As a more conservative alternative, it is recommended that the reporting threshold for the storage, release, or disposal of radionuclides all be set at the RQ.

Note that the RQs for all radionuclides in 40 CFR Table 302.4, Appendix B are in units of curies (or becquerels) based on radiation hazard not weight in pounds (or kilograms) as in Table 302.4. The curie (Ci) represents a rate of radioactive decay where one curie is the quantity of any radioactive nuclide which undergoes  $3.7 \times 10^{10}$  disintegrations per second. The becquerel undergoes one disintegration per second, and therefore, one curie is equal to  $3.7 \times 10^{10}$  becquerel.

and the environment that has been taken or will be completed. Attach the report of radioactive substance activity and of any remedial action to the Standard Form 118 (Appendix A) for the property. If no hazardous substance (including radioactive substance) activity took place at the property, then you must attach to the Form 118 the following statement:

*DOE has determined, in accordance with regulations issued by the Environmental Protection Agency at 40 CFR Part 373, that there is no evidence to indicate that hazardous substance activity took place on the property during the time the property was owned by the United States.*

### **8.6 Relationship to Environmental Baseline Survey**

Note that information gathered about the presence of radionuclides or radioactive contamination on a facility must also appear in an environmental baseline survey (see Chapter 12). You may conduct part of or the entire environmental baseline survey yourself. If you conduct your own environmental baseline survey, it is recommended that you follow ASTM E-1528-93 Standard, "Standard Practice for Environmental Site Assessments: Transaction Screen Process." Alternatively, you may have an

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environmental professional, such as an environmental auditor, conduct the assessment in accordance with ASTM E-1527-94 Standard, "Standard Practice for Environmental Site Assessments: Phase I Environment Site Assessment Process." The use of a Certified Health Physicist is recommended to avoid overlooking an item that could be regulated under any of the above regulations or if you do not know whether an item is in compliance.

### 8.7 Relationship to Occupational Safety and Health Baseline Survey

Include the information gathered about the presence of any equipment that is part of a real property and that emits ionizing radiation in any occupational safety and health baseline survey for the property. Workers who inspect, service, transport, or operate equipment that emits ionizing radiation must comply with the Ionizing Radiation Standard under the Occupational Safety and Health Administration (OSHA) regulations at 29 CFR 1910.96. Workers who clean up spills or respond to radioactive releases require the Hazardous Waste Worker and Emergency Response Operations Standard training under regulations at 29 CFR 1910.120.

### 8.8 Relationship to NEPA Documents

Discuss the existence of radionuclides and radioactive contamination in any NEPA document required to be prepared regarding the proposed transfer of DOE real property. Radionuclides and radioactive contamination are almost always a sensitive issue with the public and stakeholders.

### 8.9 Leases and Other Outgrants

CERCLA § 120(h)(5) requires that you notify the appropriate state official(s) of any lease of DOE real property on which radionuclides have been stored beyond one year, disposed of, or released if the lease encumbers the property beyond the date of termination of operations on the property (see Exhibit 6-1). The notification must be made before entering into the lease and must include information on the length of the lease, name of the lessee(s), and the uses allowed by the lease. (There may be instances in which DOE or another authority will

impose restrictions on the management and/or use of the property if the residual radioactive material guidelines of Chapter IV of DOE Order 5400.5 are not met or if other applicable Federal, State, or local requirements cause the imposition of such restrictions.) Moreover, be aware that the notification of states regarding UMTRA sites may be handled differently when such sites are included in state cooperative agreements in accordance with the requirements of Section 103 of the Uranium Mill Tailings Radiation Control Act of 1978 and 40 CFR Part 192.

Although not required, it is a best management practice to notify the lessees, occupants, or tenants of the locations of any equipment emitting ionizing radiation. If such equipment is a part of the real property included in the lease (e.g., a reactor), make available copies of service, inspection, and maintenance records.

### 8.10 Notice of Intention to Relinquish

If the real property being declared excess is withdrawn land, the Notice of Intention to Relinquish to be prepared and submitted to the Bureau of Land Management must include any information on the extent of radioactive contamination and measures that have been taken or will be taken for decontamination. As explained in § 1.6.2, contamination is one of the 13 items that must be addressed, although there is no specific standard form for providing the information.

### 8.11 Invitation for Bids/Offers

If the storage, release, or disposal of radionuclides (or any hazardous substance) was reported in the attachment to Form 118 (see § 8.5), then GSA requires that the disposal agency (itself or DOE, as the case may be) incorporate the information reported with the following statements (as prescribed in 41 CFR 101-47.304-14) into the Invitation for Bids/Offers to Purchase:

#### *NOTICE REGARDING HAZARDOUS SUBSTANCE ACTIVITY:*

*The information contained in this notice is required under the authority of regulations promulgated under Section 120(h) of the Comprehensive Environmental Response, Compensation, and*



*Liability Act (CERCLA or "Superfund") 42 U.S.C. Section 9620(h).*

*The holding agency (i.e., DOE) advises that (provide information on the type and quantity of hazardous substances; the time at which storage, release, or disposal took place; and a description of the remedial action taken.)*

*All remedial action necessary to protect human health and the environment with respect to the hazardous substance activity during the time the property was owned by the United States has been taken. Any additional remedial action found to be necessary shall be conducted by the United States.*

In the case where the purchaser is a potentially responsible party with respect to radionuclides, you must modify the above statement to represent the liability of the potentially responsible party for any remedial action.

## **8.12 Requirements for the Contract and Deed**

If an amount equal to or greater than the RQ of a radionuclide (see 40 CFR 302, Table 302.4, Appendix B) has been stored (see glossary) for one or more years, or if an amount equal to or more than the RQ of a radionuclide has been disposed of, spilled, or otherwise released on DOE property (see Exhibit 6-2), report the following information on the contract (for sale, lease, or other transfer) and deed in accordance with 40 CFR 373.3 and CERCLA § 120(h)(1) and (3):

- (1) Name and mass number of the radionuclide(s) (e.g., Carbon-14).
- (2) Quantity (in curies) of the radionuclides stored, or known to have been disposed of, spilled, or otherwise released on the property.
- (3) Dates on which radionuclide storage, release, or disposal occurred.
- (4) Description of remedial action (if any).  
[This description is not required by 40 CFR Part 373 but is by CERCLA § 120(h)(3)(A)(i)(III) to be put on the deed only.]

- (5) The following statement: "The information contained in this notice is required under the authority of regulations promulgated under Section 120(h) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or "Superfund") 42 U.S.C. Section 9620(h)." [This statement is not required by CERCLA § 120(h)(1) or (3) but by 40 CFR 373.3 to be put on the contract (for sale, lease, or other transfer only).]

In accordance with DOE Order 5400.5, Chapter II, § 5, ¶ (5), the records of the released property are required to include:

- (1) A description or identification of the property;
- (2) The date of the last radiological survey;
- (3) The identity of the organization and the individual who performed the monitoring operation;
- (4) The type and identification number of the monitoring instruments;
- (5) The results of the monitoring operation; and
- (6) The identity of the recipient of the released property.

In addition, you must attach a covenant to the property deed (not required for leases) if the property is not being transferred to a potentially responsible party with respect to the real property. The covenant must warrant the following pursuant to CERCLA § 120(h)(3)(A)(ii) and (iii):

- (1) *All remedial action necessary to protect human health and the environment from radionuclides remaining on the property has been taken before the date of the property transfer. (Note: all remedial action has been considered taken if the construction and installation of an approved remedial design has been completed and the remedy has been demonstrated to EPA to be operating properly and successfully. The carrying*

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*out of long-term pumping and treating, or operation and maintenance, after the remedy has been demonstrated to EPA to be operating properly and successfully does not preclude the property transfer.)*

(2) *Any additional remedial action found to be necessary after the date of property transfer shall be conducted by the United States.*

(3) *Permission granting the United States access to the real property in any case in which remedial or corrective action is found to be necessary after the property transfer.*

See § 14.3.4 for how paragraph (1) above of the covenant statement may be deferred under CERCLA § 120(h)(3)(C).

### 8.13 Notification of Change in Ownership

Notify the appropriate NRC Regional Administrator of a change in facility status with respect to radionuclides and equipment with radioactive sources. Such a change includes a change in ownership as well as activities associated with a change in ownership.

### 8.14 Checklist

- ☐ Are there any radionuclides or radioactive contamination on the real property? (If not, stop here.)
- ☐ Has all radioactive surface contamination been cleaned up to levels specified in "Generic Guidelines for Residual Radioactive Material" (which is shown in Exhibit 8-1 in this chapter) in DOE Order 5400.5?
- ☐ Have the radionuclide data gathered on the real property being declared as excess been included in the environmental site assessment or environmental baseline survey?
- ☐ Have the radionuclide data gathered on the real property being declared as excess been

included in the occupational safety and health baseline survey?

- ☐ If radioactive materials or contamination had been present, has information on cleanup and assurance of compliance with requirements on residual radioactive materials been included in an environmental assessment or environmental impact statement for a real property transfer?
- ☐ If the real property is being offered for lease, have the appropriate State officials been notified as described in § 8.9?
- ☐ If the real property is being offered for lease, license, or permit (see glossary), will the tenants and occupants be informed about the presence and location of equipment with radioactive substances as a best management practice?
- ☐ If the real property being declared excess is withdrawn land, have data on the extent of radioactive contamination and decontamination measures been included in the Notice of Intention to Relinquish to the Bureau of Land Management?
- ☐ Have the radionuclide data gathered on the real property being declared as surplus been included in the Invitation for Bids/Offers described in § 8.11?
- ☐ Have the radionuclide data gathered on the real property and the 40 CFR 373.3 information statement and the covenant been included in the contract (for sale, lease, or transfer) and deed as described in § 8.12?
- ☐ Has the appropriate NRC Regional Administrator been notified of any changes in ownership affecting the status of an NRC license?

### 8.15 References

ASTM, 1994. "Standard Practice for Environmental Site Assessments: Phase I Environment Site Assessment Process," American Society for

Testing and Materials E-1527-94 Standard,  
June 1993.

ASTM, 1993. "Standard Practice for  
Environmental Site Assessments: Transaction  
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